

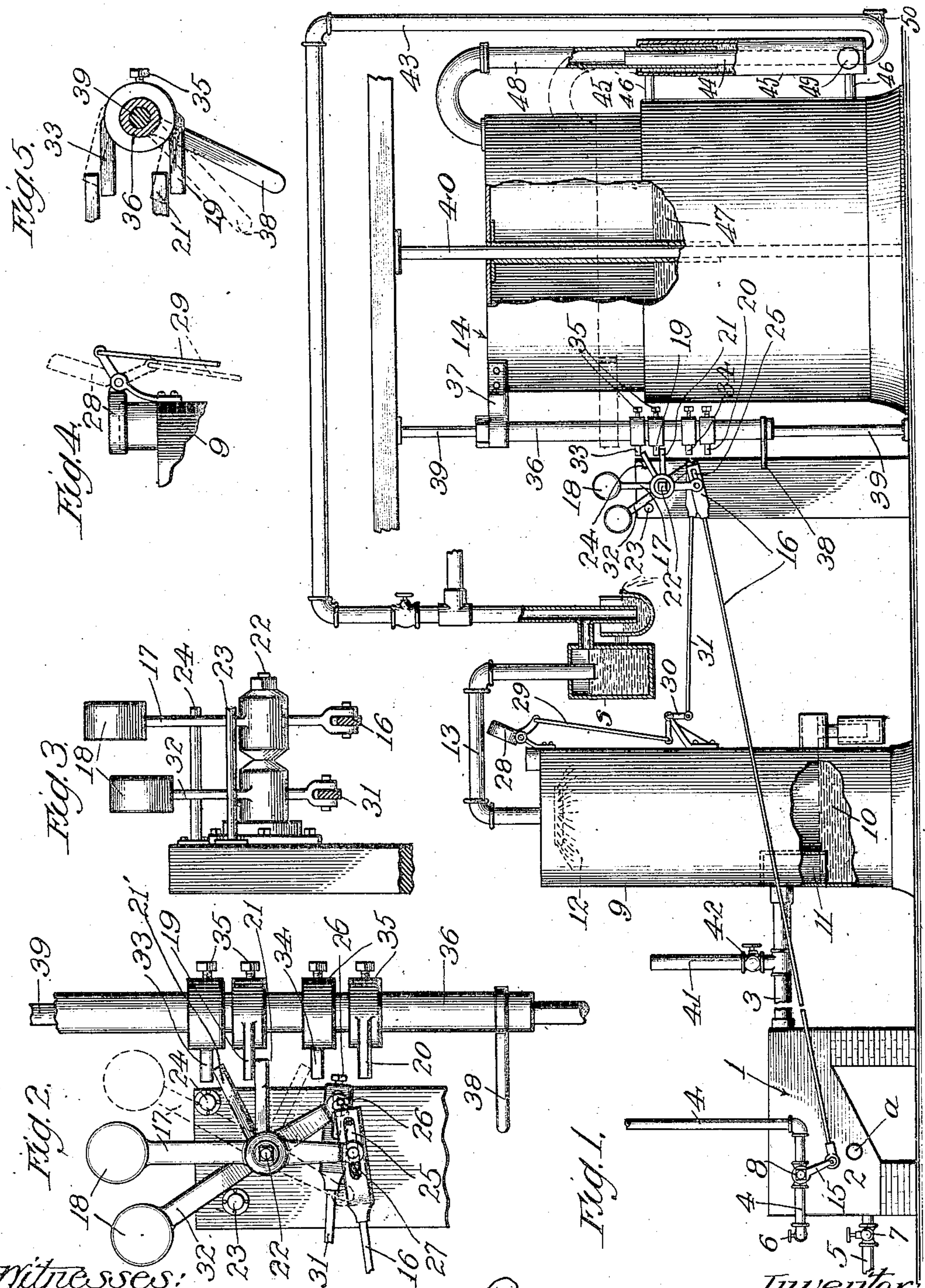
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E. H. AMET.

GAS APPARATUS.

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UNITED STATES PATENT OFFICE.

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GAS APPARATUS.

No. 886,311.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed August 6, 1907. Serial No. 387,382.

To all whom it may concern:

Be it known that I, EDWARD H. AMET, a citizen of the United States, residing at Phoenix, in the county of Maricopa and Territory of Arizona, have invented new and useful Improvements in Gas Apparatus, of which the following is a specification.

This invention relates to improvements in gas apparatus for producing a fixed gas from hydrocarbon oils, and may be applicable to various forms of gas producers; but it has been especially designed to accompany a form of gas making apparatus heretofore invented by me, and which is described and claimed in a copending application filed by me January 21, 1907, Serial No. 353,384, in which the gas is produced by admitting hydrocarbon oil and air to a dissociating chamber, where the oil is ignited and from whence the gaseous products are conducted through a combining tube where they combine and become a fixed gas which is thence conducted to the usual scrubber and to the engine or burner where it is to be used. Owing to the high producing power of said newly invented gas apparatus, as compared with its size and cost, it is more economical of space and cost of plant, and labor to provide producers of sufficient capacity and number to insure a maximum output at all times, than to provide large storage holders. In such newly invented gas apparatus the oil and air must be admitted in certain proportions for a determined quality of gas, and when such proportions have been determined by adjusting the valves of the apparatus, the operation of the apparatus will constantly produce a certain quantity of gas of the determined quality. To change the quantity without changing the quality both the oil and air valves must be readjusted. In case the consumption of such gas falls below the determined quantity, as by cutting off the gas at the burners or engines or other place or places of consumption, all surplus gas produced must be stored or wasted; otherwise the quality of gas will vary unless the valves are readjusted, thus requiring attention or automatic regulation.

In practical operation it is advisable to

produce with each producer a somewhat greater quantity of gas than will be consumed at the time of immediate production, so as to insure certainty of operation at the place of consumption. This necessitates the use of a holder to take care of the surplus gas.

An object of this invention is to insure high economy and satisfactory operation with a gas holder of minimum size. In case the discharge of gas is at any time throttled, so as to cause any inordinate back pressure within the producer, without changing the amount of oil admitted to the producer, accumulations of coke and carbon occur in the producer, thus reducing the efficiency of the plant, and at the same time causing a variation in and impairment of the quality of the gas.

An object of this invention is to provide an automatically controlled gas apparatus, adapted to produce a determined quality of gas, under varying demands as to quantity, and to do this with minimum storage capacity, with minimum attention and with maximum economy of fuel; and at the same time to provide for keeping the producer practically free from accumulation of coke.

The invention may be embodied in different forms and I shall illustrate the same herein in the best form in which I at present contemplate embodying the same.

A further object is to provide against escape of incandescent matter from the apparatus.

The accompanying drawings illustrate the invention:—

Figure 1 is a side elevation of a gas apparatus embodying this invention. The parts are shown in position with the oil cut off valve closed, the blow off valve open, and the holder at the point where it has brought one by-center bell-crank to the turning point for closing the oil cut off valve and is about to start the other bell-crank preparatory to closing the blow off valve or vent for waste products of combustion. Fig. 2 is an enlarged detail of the means for actuating the oil valve and blow off, the parts being in position for turning on the oil and before closing the blow off. Fig. 3 is a detail from the

left of Fig. 2. Fig. 4 is a detail of the blow off closed. Fig. 5 is a sectional plan of the tripping device or operating the by-center bell-cranks showing the ends of the crank arms and showing sleeve turned to throw the tripping lugs out of commission. Dotted lines indicate the position of parts when the tripping lugs are in position for operating the by-center bell-cranks.

10 1 is the gas producer comprising a dissociating chamber 2 and a combining tube 3.

4 and 5 are oil and compressed air supply pipes and 6 and 7 the regulating valves therefor, respectively.

15 8 is a cut-off valve for the oil pipe; 9 the scrubber and 10 the water-seal at the bottom thereof.

11 is the diving flue leading from the combining tube 3 of the producer into the water seal 10, whence the gas escapes into the scrubber and is washed by the usual spraying device 12, above which the usual gas outlet discharge pipe 13 leads to the place of consumption, not shown, and to a holder 14, which rises and falls as the supply is increased and reduced above and below the demand at place of consumption.

The cut-off valve 8 is operable by an arm 15 connected by a link 16 with a weighted by-center bell-crank 17, the weight 18 of which is sufficient to operate the valve 8.

19 and 20 are tripping lugs carried by the movable holder 14 and arranged to engage an arm 21 of the weighted bell-crank to operate the same to shift the weight 18 of said bell-crank from one to the other side of a vertical line drawn from the axis 22 of the bell-crank 17.

23 and 24 designates stops for the bell-crank on opposite sides of said vertical line to sustain the weight 18 and limit the movement of the bell-crank to that requisite for the operation of the link 16 and the cut-off valve 8. The link 16 is provided at its end with a slot 25 to allow movement of the bell-crank throughout the ascending half of its travel without operation of the link.

26 designates set-screws for regulating the length of the slot 25 and the consequent throw of the link 16.

28 is a blow-off-valve connected by a connection 29 with a bell-crank 30 that is connected by a link 31 with a weighted by-center bell-crank 32 corresponding to the weighted bell-crank 17, and which is operable by tripping lugs 33, 34, which are arranged to shift the bell-crank 32 an interval after the lugs 19, 20, have shifted the bell-crank 17 at the down and up movements respectively, of the holder 14. The purpose of this is to close the oil cut-off valve four or five seconds, more or less, before the blow-off valve 28 opens when the holder 14 is rising beyond a certain level, and to open the oil cut-off valve

a few seconds, more or less, before the blow-off valve closes when the holder is descending below a certain level.

The lugs 19, 20, and 33, 34 are preferably adjustable by means of set-screw held collars 35, so that the interval that elapses between the closing of the oil-valve and the opening of the blow-off, on the one hand, will be sufficient to allow the gas in the producer and scrubber to pass on into the holder before the blow-off is opened; and, on the other hand, will allow the oil to be turned on just before the blow-off is closed, so that the atmospheric air or products of combustion in the producer and scrubber may be expelled into the external-air by the new charge of gas.

36 is a sleeve which is rotatable in arm 37 and is thereby connected with the holder 14. Said sleeve carries the adjustable collars 35 with their lugs 19, 20, 33 and 34.

38 is a handle to turn the sleeve to bring the lugs into and out of operative position.

39 is a guide for the sleeve and holder, and 40 is a guide for the holder.

41 is a telltale or test pipe provided with a valve 42 and opening from the gas-combining and fixing pipe for the purpose of testing the quality of the gas.

In practice, when the sleeve is turned into the position shown in solid lines in Fig. 5, the holder 14 is free to rise and fall without interference with the valves. In starting the apparatus into operation the sleeve will be turned out of commission, thus leaving the oil cut off and scrubber blow off valves free to be operated by hand.

The test pipe 41 provided with the valve 42 will be opened and then air and oil will be turned on through pipes 4 and 5 and will be ignited at the ignition opening which is usually closed by a plug *a*.

The attendant will test the quality of gas by igniting the same at the pipe 41, and will adjust the valves 6 and 7 until the quality is satisfactory. Then he will close the valve 42 and thereupon the blow off valve 28 being closed, the gas will flow through pipe 13 to the place of use, the surplus gas passing into the holder 14 which rises as the gas accumulates therein.

When the lugs rise to a height where they can operate the by-center levers, the attendant will turn the sleeve, so as to bring the lugs into operative position. In this position of the holder, the blow off bell crank 22 is in position to allow the weighted blow off valve 28 to close. Consequently the gas which flows into the producer is conducted onward to the place of consumption and to the holder. The production of gas will now proceed at the full capacity for which the producer as thus adjusted is capable, and any surplus production over the consump-

tion at the place or places where the gas is to be used will become stored in the holder, thus causing the holder to rise and carry the finger 20 up into engagement with the arm 21, thereby raising the arm 21 until the weight 18 of the bell crank overbalances, whereupon the bell-crank 17 actuates the link 16 in the direction indicated by the arrow in Fig. 1, thus to close the cut-off-valve 8, whereupon oil ceases to flow into the producer and the production of gas practically ceases, and any gas that may be produced from oil already in the producer at the moment the weighted bell-crank 18 was shifted, will be driven out by compressed air from pipe 5 and into the holder. The ascending holder now causes the lug 33 to throw the bell-crank 30 so as to open the blow-off valve 28 through which the products from the producer may now escape to the open air. This relieves the air pressure in the producer so that no further supply passes the seals in pipe 13 while valve 28 is open.

If the consumption of gas continues, gas will flow from the holder until the same falls sufficiently to cause the lug 19 to again shift the weighted bell-crank 17, thus opening the oil-valve to supply oil to the producer, whereupon the production of gas again begins. The lug 33 now acts on the arm 21' of the bell-crank 32 and causes the blow-off valve 28 to close, thereby causing the production and delivery of gas to be resumed.

The dissociating chamber 2 is made of refractory material which becomes quite hot on the inside and accumulations of coke therein may retain an incandescent condition for a considerable period, say twenty minutes, more or less, after the oil has been shut off and combustion will then be supplied in the chamber by the air and the accumulated coke, and consequently if the holder does not remain up so long as to allow all the coke to burn out and the interior of the producer to cool below the igniting temperature, ignition will result, and the production of gas will begin immediately whenever oil is turned on at the valve 8. The burning out of the coke at intervals tends to keep the producer free from clogging.

The pipe 43 that leads to the gas-holder 14 has an upright section 44 that passes up through a stand-pipe 45 which is connected by pipes 46, 46' with the water-seal 47 of the gasometer. A pipe 48 carried by the gas-holder 14 and opening into the top thereof telescopes over the upright section 44, and its lower end extends below the water-seal 47 and is thereby sealed. By this arrangement the gas pipe is readily accessible throughout its full extent from scrubber to gas-holder without disturbing the gasometer or its foundations. Cap 49 and plug 50 are provided for cleaning purposes.

What I claim is:—

1. A fixed gas apparatus comprising a dissociating chamber, means for supplying air to said chamber, means for supplying oil to said chamber, a cut-off valve for the oil supply, a gas holder connected with the dissociating chamber to receive gas therefrom, and means operable by the rise and fall of the holder to turn on and cut off the oil and to relieve the air pressure. 65 70

2. In a fixed gas apparatus, a dissociating chamber, regulable means to supply air thereto, regulable means to supply oil to said chamber, a cut-off valve for the oil supply means, a gas holder connected with the dissociating chamber to receive gas therefrom, and means operable by the rise and fall of the holder to turn on and shut off the oil and to relieve the air pressure. 75 80

3. A fixed gas apparatus comprising a dissociating chamber, means for supplying air to said chamber, means for supplying oil to said chamber, a cut-off valve for the oil supply, a gas holder connected with the dissociating chamber to receive gas therefrom, means operable by the rise and fall of the holder to turn on and cut off the oil, blow-off means between the dissociating chamber and the gas holder, and means operable by the rise and fall of the gas holder to open and close the blow-off means. 85 90 95

4. In a fixed gas apparatus, a dissociating chamber, regulable means to supply air thereto, regulable means to supply oil to said chamber, a cut-off valve for the oil-supply means, a gas holder connected with the dissociating chamber to receive gas therefrom, means operable by the rise and fall of the holder to turn on and shut off the oil, blow-off means between the dissociating chamber and the gas-holder, and means operable by the rise and fall of the gas holder to open and close the blow-off means. 100 105

5. A gas producer, a scrubber to receive gas therefrom, blow-off means for the scrubber, a gas-holder connected with the scrubber, air and oil supply means for the producer, means operable by the rise and fall of the holder to turn on and cut off the oil supply, and means operable by the rise and fall of the holder to open and close the blow-off. 110 115

6. A gas producer, a scrubber to receive gas therefrom, blow-off means for the scrubber, a gas-holder connected with the scrubber, air and oil supply means for the producer, means operable by the rise and fall of the holder to turn on and cut off the oil supply, and means operable by the rise and fall of the holder to open the blow-off after the oil has been cut off and to close the blow-off before the oil is turned on. 120 125

7. A gas producer, a scrubber to receive gas therefrom, blow-off means for the scrubber, a gas-holder connected with the scrub-

ber, air and oil supply means for the producer, adjustable means operable by the rise and fall of the holder to turn on and cut off the oil supply, and adjustable means operable by the rise and fall of the holder to open the blow-off after the oil has been cut off and to close the blow-off before the oil is turned on.

In testimony whereof, I have hereunto set my hand at Los Angeles California this 30th day of July 1907.

EDWARD H. AMET.

In presence of—

JAMES R. TOWNSEND,
M. BEULAH TOWNSEND.